Exercise 92

Show that the function $f(x) = 3(x-5)^2 + 7$ is not one-to-one.

Solution

Notice that the function has the same output for two different values of x.

$$f(0) = 3(0-5)^2 + 7 = 3(-5)^2 + 7 = 3(25) + 7 = 75 + 7 = 82$$

$$f(10) = 3(10-5)^2 + 7 = 3(5)^2 + 7 = 3(25) + 7 = 75 + 7 = 82$$

Therefore, $f(x)$ is not a one-to-one function.